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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR    | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-------------------------|---------------------|------------------|
| 10/720,817      | 11/24/2003  | Abhay Sudhakar Rao Kant | 133918-1            | 5358             |

41838 7590 11/09/2007  
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| EXAMINER |
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LAU, TUNG S

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| ART UNIT | PAPER NUMBER |
|----------|--------------|

2863

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| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

11/09/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/720,817

Applicant(s)

KANT ET AL.

Examiner

Tung S. Lau

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 51, 52, 54-58, 60-70, 72-74 and 76-104 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 51, 52, 54-58, 60-70, 72-74, 77-84, 86-94 and 96-104 is/are rejected.
- 7) ☒ Claim(s) 76, 85 and 95 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date 8/29/07
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/14/2007 has been entered.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a. Claims 1, 3, 4, 51, 52, 54, 56, 62, 64, 66, 68, 70, 72, 74, 67, 55, 73, 57, 58, 60, 61, 87, 91 and 104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nippes (U.S. Patent 6,460,013) in view of Sato (U.S. Patent 4,478,082).

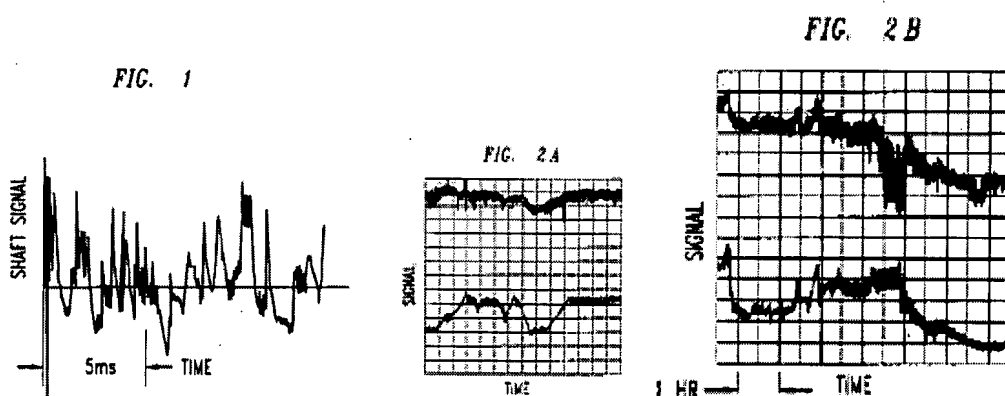
**Regarding claim 1:**

Nippes describes a system for detecting a rub in a turbomachine comprising: a turbomachine comprising a rotor (col. 3, lines 34-35), a stator (col. 3, lines 34-35), sensors configured to monitor turbomachine

conditions (fig. 3, unit 306, 308); and an on site--monitor in communication with the sensors (fig. 3, unit 324), wherein the on-site monitor is configured to analyze the turbomachine conditions to identify abnormal behavior indicative of a rub (col. 3, lines 40-54) in at least near real time (col. 2, lines 41-62) in the turbomachine between tip portions of the plurality of blades and corresponding seal portions (col. 2, lines 6-21) of the turbomachine (fig. 3, unit 306, 302, 304); wherein the abnormal behavior comprises a high vibration amplitude (col. 3, lines 40-54, fig. 2c, col. 2, lines 23-40), or a high variation in vibration amplitude, or a sudden change in vibration amplitude, or a combination thereof.

Nippes does not describe a plurality of blades extending radially from the rotor, or the stator. Sato describes a plurality of blades extending radially from the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades extending radially from the rotor taught Sato by order to be able to minimize damage condition to the turbine with minimum cost.



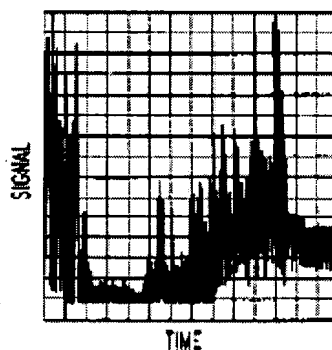
**Regarding claim 3:**

Nippes describes a computer implemented method for detecting a rub in a turbomachine (fig. 3), the method comprising: monitoring turbomachine conditions, wherein the turbomachine comprises a rotor (col. 3, lines 34-35), a stator (col. 3, lines 34-35), determining whether a rub (col. 3, lines 40-54) is occurring between tip portions of the plurality of blades (fig. 3, 306, 304, 302) and corresponding seal portions (col. 2, lines 6-21) of the turbomachine (fig. 3, 306, 302, fig. 4, 404, 408) based at least in part on a high vibration amplitude (col. 3, lines 40-54. fig. 2c, col. 2, lines 23-40), or a high variation in vibration amplitude, or a sudden change in vibration amplitude, or a combination thereof; and outputting an indication of the rub to a computer display (fig. 5, unit 522, fig. 7, 708).

Nippes does not describe a plurality of blades extending radially from the rotor, or the stator. Sato describes a plurality of blades extending radially from the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades extending radially from the rotor taught by Sato order to be able to minimize damage condition to the turbine with minimum cost.

FIG. 2C



**Regarding claim 4:**

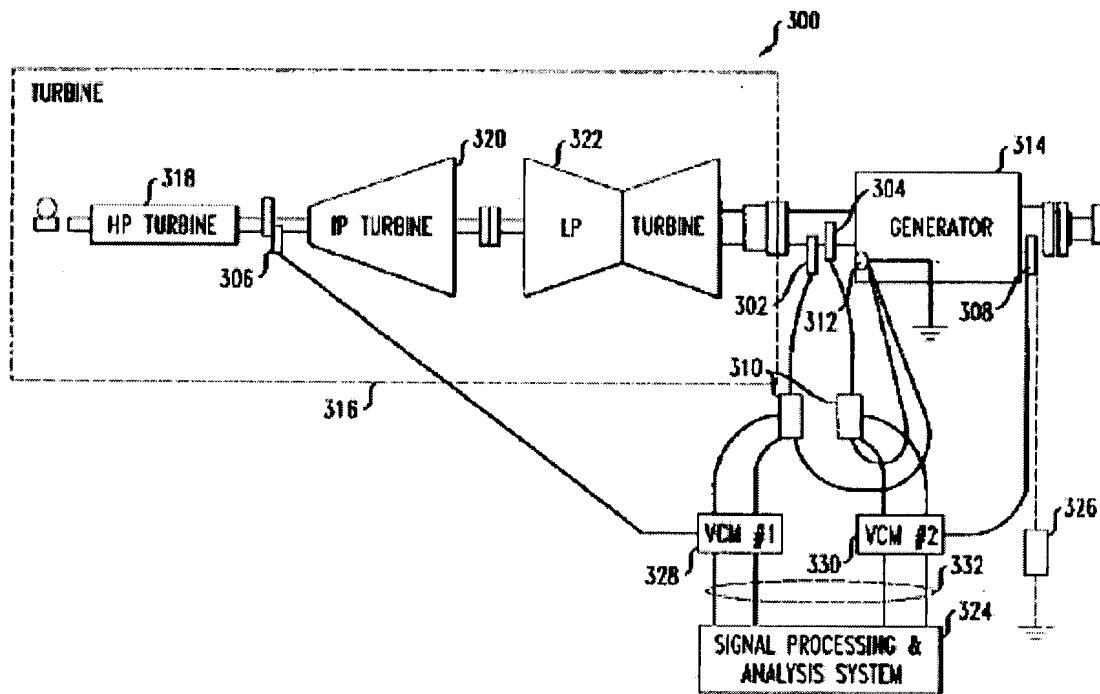
Nippes describes a storage medium encoded with a machine-readable computer program code (fig. 3, unit 324, fig. 5, unit 518) for detecting whether a rub is occurring in a turbomachine (col. 3, lines 40-54), the storage medium including instructions for causing a computer to implement a method (fig. 3, unit 324, fig. 5, unit 518) comprising: obtaining data indicating turbomachine conditions (fig. 2c), wherein the turbomachine comprises a rotor (col. 3, lines 34-35), a stator (col. 3, lines 34-35), determining whether a rub is occurring (col. 3, lines 40-54) between tip portions of the plurality of blades and corresponding seal portions of the turbomachine (fig. 3, unit 306, 302, 304) based at least in part on an abnormal vibration (col. 3, lines 40-54, col. 2, lines 23-40)

relative to a historical trend (fig. 2a-2c, col. 2, lines 23-40, col. 2, lines 23-40): and outputting an indication of the rub to a computer display (fig. 5, unit 522, fig. 7, 708).

Nippes does not describe a plurality of blades extending radially from the rotor, or the stator. Sato describes a plurality of blades extending radially from the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades extending radially from the rotor taught Sato by order to be able to minimize damage condition to the turbine with minimum cost.

FIG. 3



**Regarding claim 51:**

Nippes describes a system (fig. 3), comprising: a turbomachine comprising a rotor (col. 3, lines 34-35), a stator (col. 3, lines 34-35), means for monitoring turbomachine conditions (col. 1, lines 39-51); and means for detecting whether a rub (col. 3, lines 40-4) is occurring in the turbomachine between tip portions of the plurality of blades and corresponding seal portions of the turbomachine (col. 3, lines 24-54) based on an abnormal vibration value (col. 3, lines 40-54, fig. 2c, col. 2, lines 23-40), an abnormal eccentricity value, an abnormal response to a transient condition, an abnormal response to a variation in load, an

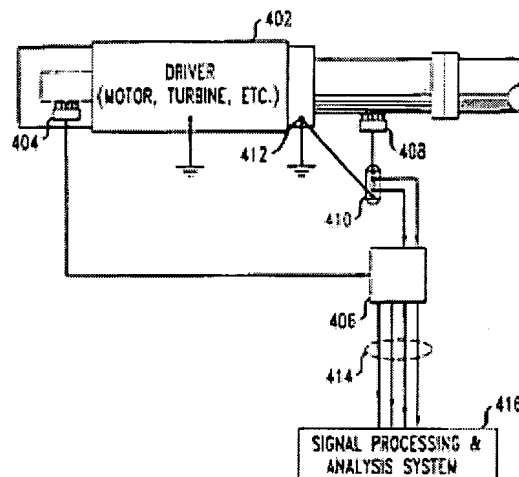


abnormal response to a variation in pressure, or an abnormal differential expansion of the stator and the rotor, or a combination thereof.

Nippes does not describe a plurality of blades extending radially from the rotor, or the stator. Sato describes a plurality of blades extending radially from the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades extending radially from the rotor taught by Sato order to be able to minimize damage condition to the turbine with minimum cost.

FIG. 4



**Regarding claim 52:**

Nippes describes a system (fig. 3), comprising: a plurality of turbomachine sensors (fig. 3, unit 306, 302, 304, 308) configured to couple to a

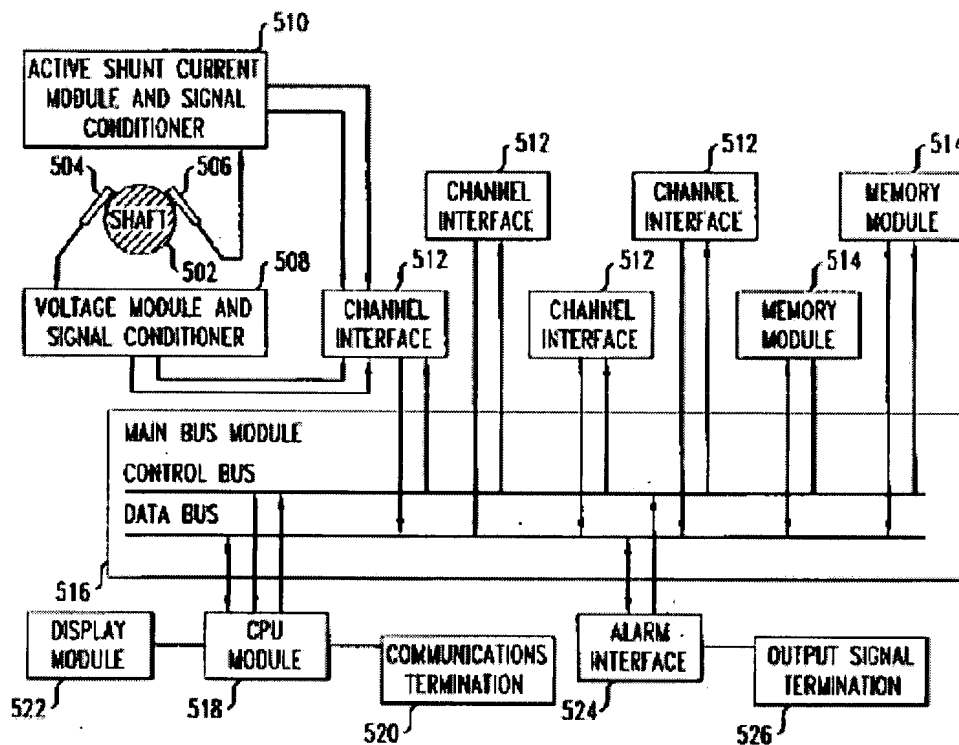
turbomachine comprising a rotor (col. 3, lines 34-35), a stator (col. 3, lines 34-35), wherein the plurality of turbomachine sensors (fig. 3, unit 306, 302, 304, 308) is configured to sense operational parameters of the turbomachine (col. 3, lines 24-54); and a rub detection system (col. 3, lines 40-54) configured to monitor the plurality of turbomachine sensors (fig. 3, unit 306, 302, 304, 308) and to detect a turbomachine rub event (col. 3, lines 40-54) occurring between tip portions of the plurality of blades and corresponding seal portions (col. 2, lines 6-21) of the turbomachine (fig. 3, lines 306, 302, 308) based on one or more abnormal conditions (fig. 2c) , wherein the abnormal conditions comprise an abnormal vibration value (col. 3, lines 40-54, col. 2, lines 23-40), an abnormal eccentricity value, an abnormal response to a transient condition, an abnormal response to a variation in load, an abnormal response to a variation in pressure, and an abnormal differential expansion of the stator and the rotor (col. 4, lines 42-61).

Nippes does not describe a plurality of blades extending radially from the rotor, or the stator. Sato describes a plurality of blades extending radially from the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades

extending radially from the rotor taught by Sato order to be able to minimize damage condition to the turbine with minimum cost.

FIG. 5



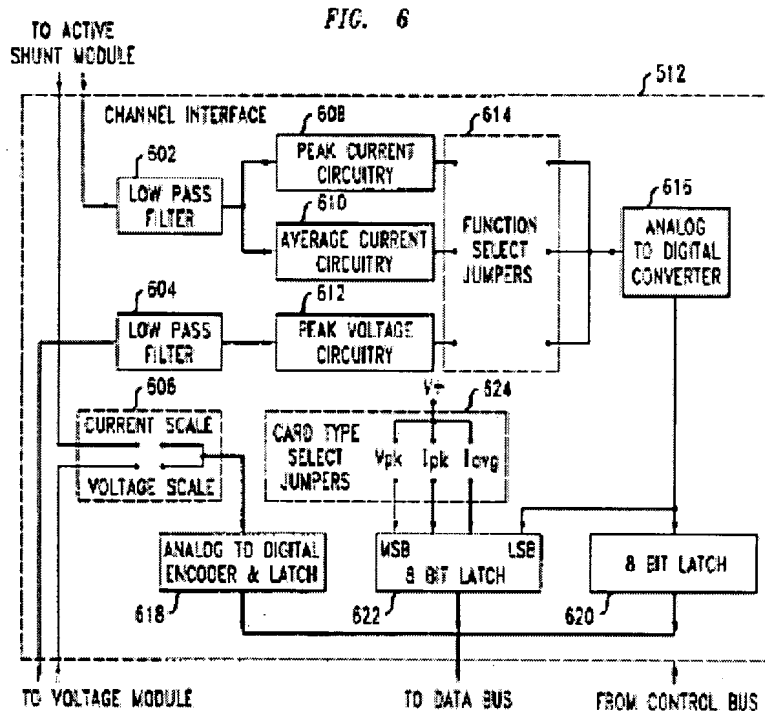
**Regarding claim 54:**

Nippes describes a system (fig. 5) , comprising: a rub detection system (col. 3, lines 40-54) configured to monitor operational parameters of a turbomachine (col. 1, lines 39-51) comprising a rotor (col. 3, lines 34-35), a stator (col. 3, lines 34-35), wherein the rub (col. 3, lines 41-54) detection system is configured to detect a turbomachine rub (col. 3, lines 41-54) event occurring between tip portions of the plurality of blades and corresponding seal portions of the turbomachine (fig. 5, unit 306, 302, 304, 308) based on one or more abnormal conditions (fig. 2c), wherein

the abnormal conditions comprise a high vibration amplitude (col. 3, lines 41-54, col. 2, lines 23-40), a high variation in vibration amplitude (col. 3, lines 41-54, col. 2, lines 23-40), and a sudden change in vibration amplitude (col. 3, lines 41-54, col. 2, lines 23-40).

Nippes does not describe a plurality of blades extending radially from the rotor, or the stator. Sato describes a plurality of blades extending radially from the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades extending radially from the rotor taught by Sato order to be able to minimize damage condition to the turbine with minimum cost.



**Regarding claim 56:**

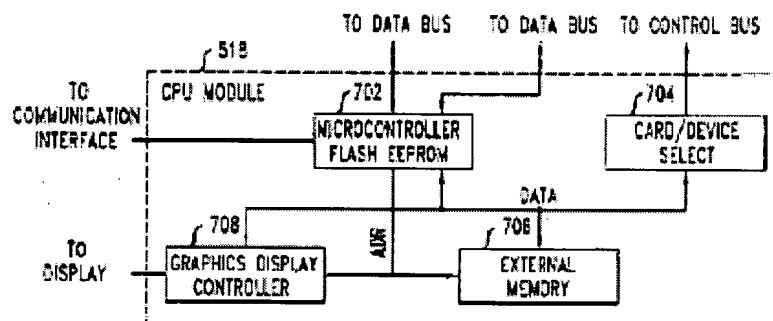
Nippes describes a computer implemented method, comprising: analyzing turbomachine operational data to detect a rub event based on one or more abnormal conditions in the turbomachine (col. 3, 24-54), wherein the turbomachine comprises a rotor (col. 3, lines 34-35), a stator (col. 3, lines 34-35), the rub event occurs between tip portions of the plurality of blades (col. 3, lines 41-54) and corresponding seal portions of the turbomachine (fig. 5, unit 306, 302, 304, 308), and the one or more abnormal conditions (col. 3, lines 24-54) comprise a high vibration amplitude (col. 3, lines 41-54, col. 2, lines 23-40), a high variation in vibration amplitude, a sudden change in vibration amplitude, an abnormal eccentricity value, an abnormal response to a transient condition, an

abnormal response to a variation in load, an abnormal response to a variation in pressure, and an abnormal differential expansion of the stator and the rotor (col. 3, lines 41-54, col. 7, lines 21-31, table 2, overheating), and a combination thereof (col. 3, lines 41-54, col. 7, lines 21-31); and outputting an indication of the rub event to a computer display (fig. 5, unit 522, fig. 7, unit 708).

Nippes does not describe a plurality of blades extending radially from the rotor, or the stator. Sato describes a plurality of blades extending radially from the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

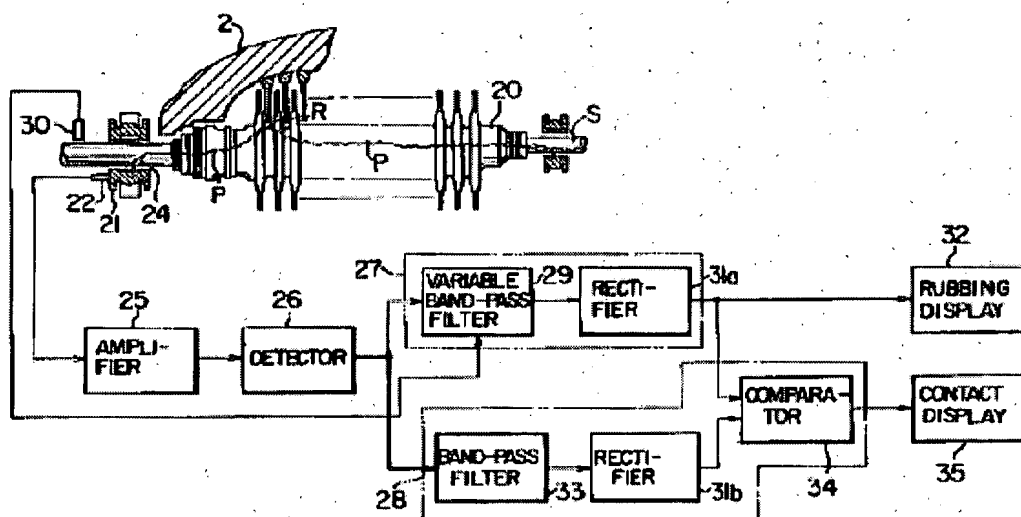
It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades extending radially from the rotor taught by Sato order to be able to minimize damage condition to the turbine with minimum cost.

FIG. 7



It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades extending radially from the rotor taught Sato by order to be able to minimize damage condition to the turbine with minimum cost.

**FIG. 8**



**Regarding claim 64,** Nippes further describes including the subject matter discussed above except the blades are disposed on the rotor, and the seals are disposed on the rotor.

Sato describes the blades are disposed on the rotor, and the seals are disposed on the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have the blades are disposed on the rotor, and the seals are disposed on the rotor taught Sato by order to be able to minimize damage condition to the turbine with minimum cost.

**Regarding claims 66, 68, 70, 72, 74,** Nippes further describes including the subject matter discussed above except the blades are disposed on the rotor, and the corresponding seals are disposed on the rotor.

Sato describes the blades are disposed on the rotor, and the corresponding seals are disposed on the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have the blades are disposed on the rotor, and the corresponding seals are disposed on the rotor taught Sato by order to be able to minimize damage condition to the turbine with minimum cost.



**Regarding claim 67**, Nippes further describes bearing (col. 2, lines 6-21) vibration (col. 3, lines 41-54).

**Regarding claim 55**, Nippes further describes rub detection system is coupled to the turbomachine (fig. 3).

**Regarding claim 73**, Nippes further describes eccentricity (fig. 2b, 2c).

**Regarding claim 57**, Nippes further describes monitoring turbomachine to obtain the operation data (fig. 5, col. 1, lines 39-51).

**Regarding claim 58**, Nippes further describes monitoring turbomachine on-site (col. 2, lines 47-62, real-time).

**Regarding claim 60**, Nippes further describes monitoring operation in real time (col. 2, lines 47-62, real-time).

**Regarding claim 61**, Nippes further describes detecting rub event in real time (col. 2, lines 47-62, real-time) with operation of turbomachine (col. 1, lines 39-51).

**Regarding claims 87, 91, 104**, Nippes further describes a rotor (col. 3, lines 34-35), a stator (col. 3, lines 34-35), the turbomachine monitor is configured to monitor the possibility of the rub between tip portions of the plurality of blades and corresponding seal portions of the turbomachine (fig. 3, unit 306, 302, 304, 308, col. 3, lines 40-54).

Nippes does not describes a plurality of blades extending radially from the rotor, or the stator. Sato describes a plurality of blades extending radially

from the rotor (fig. 8), in order to be able to minimize damage condition to the turbine with minimum cost (col. 8, lines 24-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have a plurality of blades extending radially from the rotor taught by Sato order to be able to minimize damage condition to the turbine with minimum cost.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a. Claims 63, 65, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nippes (U.S. Patent 6,460,013) in view of Sato (U.S. Patent 4,478,082) and further in view of Wakeman et al. (U.S. Patent 5,601,403).

**Regarding claim 63**, Nippes describes bearing (col. 2, lines 6-21) vibration (col. 3, lines 41-54), Nippes and Sato do not describe condenser pressure.

Wakeman describes condenser pressure (col. 9-10, lines 65-5), in order to control clearance of rotor and stator to avoid rubbing condition (col. 4, lines 30-49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes and Sato to have the condenser pressure taught by Wakeman in order to control clearance of rotor and stator to avoid rubbing condition.

**Regarding claim 65**, Nippes describes bearing (col. 2, lines 6-21) vibration (col. 3, lines 41-54), Nippes and Sato do not describe pressure. Wakeman describes pressure (col. 9-10, lines 65-5), in order to control clearance of rotor and stator to avoid rubbing condition (col. 4, lines 30-49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes and Sato to have the pressure taught by Wakeman in order to control clearance of rotor and stator to avoid rubbing condition.

**Regarding claim 69**, Nippes describes temperature (col. 3, lines 40-54), Nippes and Sato do not describe condenser pressure.

Wakeman describes condenser pressure (col. 9-10, lines 65-5), in order to control clearance of rotor and stator to avoid rubbing condition (col. 4, lines 30-49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes and Sato to have the pressure taught by Wakeman in order to control clearance of rotor and stator to avoid rubbing condition.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nippes (U.S. Patent 6,460,013) in view of Sato (U.S. Patent 4,478,082) and further in view Turbine power systems conference (February 25-26, 2002).

Nippes and Sato discloses a system including the subject matter discussed above except a server in communication with the on site monitor via an internet. Turbine power systems conference discloses a

server in communication with the on site monitor via an internet (page 12), in order to update machine data easily in a remote location with minimal staff personnel (page 14, 12, 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes and Sato to have the server in communication with the on site monitor via an internet in order to update machine data easily in a remote location with minimal staff personnel.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a. Claims 82, 100, 80, 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nippes (U.S. Patent 6,460,013) in view of Wakeman et al. (U.S. Patent 5,601,403).

**Regarding claims 82, 100,** Nippes further describes abnormal amplitude (fig. 2c), Nippes does not describes pressure, Wakeman describes pressure (col. 9-10, lines 65-5), in order to control clearance of rotor and stator to avoid rubbing condition (col. 4, lines 30-49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have pressure taught by

Wakeman in order to control clearance of rotor and stator to avoid rubbing condition.

**Regarding claims 80 and 98**, Nippes further describes the above except during the transient condition of a start up of the turbomachine. Wakeman describes the transient condition of a start up of the turbomachine (col. 10, lines 4-18), in order to detect problem condition at anytime.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nippes to have the transient condition of a start up of the turbomachine taught by Wakeman in order to detect problem condition at anytime.

MPEP was recently updated to include examination guidelines in light of KSR v. Teleflex. The update to MPEP 706.02(j) reads as follows:

35 U.S.C. 103 authorizes a rejection where, to meet the claim, it is necessary to modify a single reference or to combine it with one or more other references. After indicating that the rejection is under 35 U.S.C. 103, the examiner should set forth in the Office action:

1. the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,
2. the difference or differences in the claim over the applied reference(s),

3. the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and
4. an explanation >as to< why >the claimed invention would have been obvious to< one of ordinary skill in the art at the time the invention was made.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 77, 89, 93, 78, 94, 96, 79, 97, 81, 99, 83, 101, 84, 102, 86, 90, 103, 88 and 92 are rejected under 35 U.S.C. 102(b) as being anticipated by Nippes (U.S. Patent 6,460,013, Date of Publication Oct. 1, 2002).

**Regarding claim 77:**

Nippes describes a system (fig. 3), comprising: a turbomachine monitor configured to identify abnormal operational events as an indication of a rub between components of a turbomachine (col. 3, lines 40-54), wherein the abnormal operational events comprise an abnormal vibration value (fig. 2c, col. 3, lines 40-54), an abnormal eccentricity value, an abnormal behavior associated with a transient condition, an abnormal behavior associated with a variation in load, an abnormal behavior associated with

a variation in pressure, an abnormal steam characteristic of the turbomachine, an abnormal differential expansion, or a combination thereof.

**Regarding claim 89:**

Nippes describes a system (fig. 3), comprising: a turbomachine monitor configured to identify abnormal operational events as an indication of a rub between components of a turbomachine (col. 3, lines 24-54), wherein the abnormal operational events comprise a sudden change in vibration (col. 3, lines 24-54, col. 2, lines 22-39), a large variance in vibration relative to past data, or a large vibration amplitude relative to past data, or a combination thereof.

**Regarding claim 93:**

Nippes describes a system (fig. 3), comprising: a turbomachine monitor configured to monitor for abnormal operational events to identify a possible rub between components of a turbomachine (col. 3, lines 24-54) in at least near real time (col. 2-3, lines 63-3), wherein the abnormal operational events comprise a sudden change (fig. 2c), or a high variation, or a high value, or a combination thereof, of an operational parameter of the turbomachine (col. 3, lines 24-40).

**Regarding claims 78, 94, 96,** Nippes further describes high vibration amplitude (fig. 2c, col. 3, lines 40-54).



**Regarding claims 79, 97,** Nippes further describes abnormal eccentricity amplitude (fig. 2c).

**Regarding claims 81, 99,** Nippes further describes abnormal load amplitude (fig. 2c).

**Regarding claims 83, 101,** Nippes further describes abnormal amplitude (fig. 2c).

**Regarding claims 84, 102,** Nippes further describes abnormal differential expansion of a stator and a rotor of the turbomachine (col. 4, lines 42-61).

**Regarding claims 86, 90, 103,** Nippes further describes the turbomachine having a plurality of sensors communicative with the turbomachine monitor (fig. 3, unit 306, 302, 304, 308).

**Regarding claim 88,** Nippes further describes monitor for the rub in at least real time (col. 2, lines 47-62, real-time).

**Regarding claim 92,** Nippes further describes monitor the rub in at least real time (col. 2, lines 47-62, real-time).

***Allowable Subject Matter***

7. Claims 76, 85, and 95 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitation of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: prior art fail to teach:

**Regarding claim 76:** The abnormal behavior comprises a sudden change in vibration values during steady speed operation, axial noisiness during coast down of the turbomachine, abnormal eccentricity value when the turbomachine returns to turning gear after a rub event during deceleration, abnormal vibration during start up followed by abnormal eccentricity when the turbomachine was on turning gear, abnormal vibration followed by abnormal upper and lower shell metal temperature difference, high vibration response to first critical speed, high vibration response to second critical speed, overall vibration affected by variation in load, overall vibration affected by variation in condenser pressure, or abnormal vibration during abnormal differential expansion of the stator and the rotor, or a combination thereof.

**Regarding claim 85:** wherein the abnormal operational events comprise the abnormal vibration value, the abnormal eccentricity value, the abnormal behavior associated with the transient condition, the abnormal behavior associated with the variation in load, the abnormal behavior associated with the variation in pressure, the abnormal steam characteristic of the turbomachine, and the abnormal differential expansion, each individually and in combinations with one another.

**Regarding claim 95:** wherein the abnormal operational events comprise an abnormal vibration value, an abnormal eccentricity value, an abnormal behavior associated with a transient condition, an abnormal behavior associated with a variation in load, an abnormal behavior associated with

a variation in pressure, an abnormal steam characteristic of the turbomachine, and an abnormal differential expansion, each individually and in combinations with one another.

***Response to Arguments***

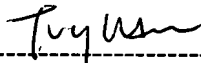
8. Applicant's arguments with respect to the amended claims have been considered but are moot in view of the new ground(s) of rejection. However, applicant's arguments filed 09/14/2007 have been fully considered but they are not persuasive.

The examiner has indicated to the applicants that further search and consideration would be needed to determined potentiality of the subject matter as required by the office during the interview with the applicants on 8-29-2007.

**Contact information**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S. Lau whose telephone number is 571-272-2274. The examiner can normally be reached on M-F 9-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Tung S. Lau, AU 2863  
Primary Examiner  
November 5, 2007